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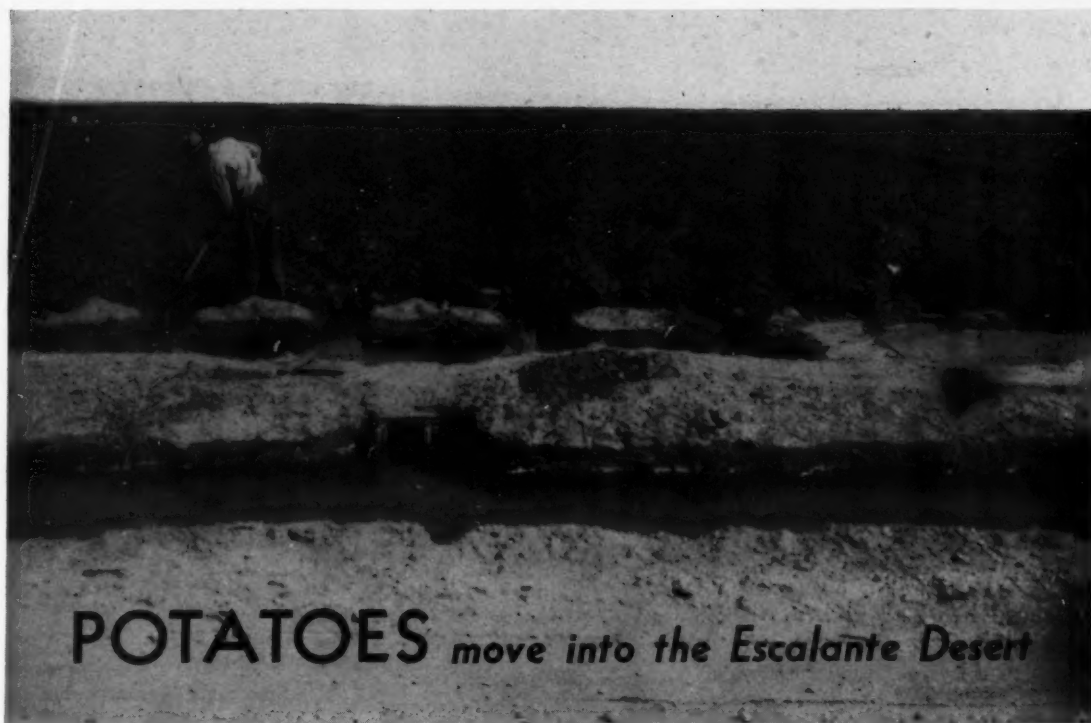
WELLINGTON BRINK, EDITOR

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*Front Cover: Terrace construction with disk plow
and tractor on L. H. Singletary farm in Georgia.
Photographer: Herrin Culver*

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POTATOES move into the Escalante Desert

By Fred P. Howard

Potatoes are being irrigated here on land that was desert a year before.



After the sagebrush was cleared a heavy tractor and scraper were used to level the land. Cuts and fills were staked by Soil Conservation Service technicians.

WITH the exception of a few scattered cultivated areas, the Escalante Desert in Southern Utah has changed little since it was first seen by Father Escalante in 1776. Most of the small

NOTE.—The author is district conservationist for the Soil Conservation Service, Cedar City, Utah.

streams in the hills surrounding the area disappear before they reach the valley. The land is covered with sagebrush and has been used mainly for grazing.

The average cost of putting in pump wells and developing lands such as this for cultivation is



\$100 per acre. Land leveling and irrigation control formerly was limited to small farms, the largest project being a 40-acre plot. It is understandable, therefore, that the Enterprise Soil Conservation District was somewhat flabbergasted when H. G. Thorns and John Zuckerman of the Weyl-Zuckerman Co. walked into the district office and casually announced that they would like to clear and level 4,000 acres of land in the Escalante Desert.

The Weyl-Zuckerman Co. is concerned chiefly with raising certified seed potatoes on a large scale. The Escalante Desert was selected because of its climate, its isolation from other areas, and its excellence of soil. Well equipped and seasoned in experience, the company has been in the seed potato business since 1912. All it asked was cooperation from the soil conservation district and technical assistance from the staff of the Soil Conservation Service.

First step was to make a topographic survey. This information was needed in planning fields, well locations, and irrigation systems. Careful study of the base map showed the land could be divided into fields of 160 acres each. Since the only source of water is an underground reservoir, a system requiring 21 deep wells was laid out. Windbreaks, overnight storage ponds, a crop rotation and fertilization figured in preliminary plans. It was also necessary to establish service roads throughout the farm. When the various types of plans were completed, the fields were staked for land leveling by means of a grid system of 100-foot squares.

The Weyl-Zuckerman Co. designed and built equipment suited to the peculiar needs of land

Ditches were put in with road equipment. Proper lengths of runs and general field layout were considered in locating them.



This machine distributes fertilizer, plants the potatoes, and makes irrigation furrows in one operation.

clearing on a large scale. Once cut, the sagebrush was raked into windrows and burned. Grade stakes were set calling for a 0.30 percent standard slope to the north and a 0.10 percent slope to the east for carrying off waste water. Dirt moving was started in April 1945, as soon as frost was out of the ground. Pick-up graders pulled by 80-horsepower tractors, were used. A 60-foot land plane followed the graders and all small irregularities were removed by making two diagonal trips and one square trip. The main irrigation ditches were made with a road patrol by angling the blade to a slope of $1\frac{1}{2}$:1. This resulted in an almost perfect ditch section. Plans are now being made to line all main ditches on the farm as a means of reducing seepage and erosion, since a large part of the soil is sandy loam. Temporary wooden headgate structures have been installed and a careful record is being kept of the amount of irrigation water applied to the fields.

(Continued on page 206)

YOUNG FARMERS

Vie With Each Other to Save Soil



THE National 4-H Soil Conservation Contest—1946—is in its third year. Open to bona fide 4-H Club members 14 to 20 years of age, with 3 or more years of supervised club work behind them, this contest has for its stated objectives:

1. To know about the value of soil.
2. To become interested in the farm family program of soil conservation for present and future production.
3. To learn through 4-H Club work how to conserve soil successfully.
4. To prevent soil wastage and deterioration on the farms.

The contest is sponsored by Federal, State, and county extension workers. Awards are donated by the Firestone Tire & Rubber Co.

In 1945 eight scholarships and trips to the National 4-H Club Congress were distributed to as many State winners; alternates also received trips to the Congress.

Recipients of \$200 college scholarships, together with their achievements, are listed as follows:

Philip W. Pierson, 17, Hockessin, Del., a 6-year member, mapped a model land-use plan for the gently rolling fields of his farm and energetically started to put it into effect. He strip-cropped a 20-acre field with corn and a soybean and Sudan grass mixture, after applying manure and fertilizer; he planted buffer strips of ryegrass in a second corn field as a temporary soil-holding measure, had soil from another tract tested for fertilizer needs, and began converting other fields to permanent pasture.

C. Jack Baird, 16, Arkansas City, Kans., noticed how much soil washed away at each rain,

and remembered that it takes 400 years to produce an inch of topsoil. To check it he influenced his father to put about one-fourth of the land in sweetclover. All cropland is now terraced and tillage and seeding operations done on the contour. The boy built a stock pond last year, and planted trees, clover, and lespedeza on badly washed spots.

Louis E. Kelly, 19, Whiteford, Md., a 3-year club member, realized something had to be done to save topsoil which was washing downhill at every rain. He started contouring every field, and it has increased the yield as high as 30 percent in some instances. He claims that conservation has done for the soil what no amount of lime and fertilizer could do by itself.

David S. Geisler, 16, Watervliet, Mich., a 5-year member, laid out a contour in a 500-tree peach orchard. He first surveyed the farm for drainage and seeded a waterway to prevent gully formation. He made tests of all fields for acidity, phosphate, and potash, and has a long-time plan to correct erosion and soil deficiency.

William C. Walker, 18, Coldwater, Miss., in club work 7 years, worked on soil conservation 2 years. During this time he cleared 125 acres of pasture and terraced 305 acres, then applied 120 tons of lime, 10 of phosphate and 10 of basic slag. He planted 55 acres of vetch and oats for intergrazing and 1½ acres of white Dutch clover. Last year he set out 10,000 pine seedlings. On other farms he constructed 25,660 feet of terraces for which he received a total of \$205.28. His livestock are now watered from a 3-acre pond.

Kenneth Fitzgerald, 20, Pauls Valley, Okla., is

a 6-year member. His family moved to a new farm in 1940 and found some fields so badly eroded that they were unfit for cultivation. In 1941 they set out 15 acres of Bermuda grass and overseeded it with Korean lespedeza. By fall of 1942 the pasture was excellent. Kenneth built more than a mile of new terraces. These, together with farming on the contour, have checked erosion in the upland fields. He also surveyed terrace lines on other farms, totaling 375 acres. He also surveyed sites on 19 farm ponds, and checked 15 dams for Government specification requirements. He and Raymond Johnson won the 1944 State agricultural engineering contest in 1944.

Tim Kaufman, 16, Delmont, S. Dak., in helping plan the 1945 crop, studied carefully the record

books and history of his farm. He then contoured 8 acres of corn and 25 acres of oats, and strip-cropped another 25-acre field. He helped haul 40 loads of manure and duckfooted all stubble except 16 acres of volunteer rye on a 50-acre pasture. The rye will be used as a green manure crop next spring. His efforts resulted in bumper small grain and corn crops this year.

Marvin A. Glover, Jr., 17, Pamplin, Va., is a 5-year member. He established two sod channels for carrying water from the field to prevent gullies, clipped weeds in the pasture to help control growth, laid out contour strips, planting alternate strips in corn and hay. He dug drainage ditches to improve grazing, and prepared and seeded lespedeza as a feed plot for wildlife.

Conserving Kentucky's Soil ♦ By James Stewart

ESSAY CONTEST STIRS STATE.—Some 4,636 Kentucky high school students know much more about soil conservation than they did a few months ago. Each of them submitted an essay in the contest sponsored last fall by the Courier-Journal, the Louisville Times and Radio Station WHAS of Louisville and the Kentucky Association of Soil Conservation District supervisors. The essay subject was "Conserving Kentucky's Soil."

James Stewart of the Sinking Fork High School and the Christian County Soil Conservation District won the State-wide first prize, a \$100 Victory bond. The essay written by this Gracey, Ky., youth begins on this page. Second place winner was Ruth Boyles, Tomkinsville High School, in the Monroe County Soil Conservation District. She received a \$50 bond. Third prize of a \$25 bond went to Avalon Skaggs, Hodgenville High School and LaRue County Soil Conservation District.

The Louisville newspapers and radio station gave \$1,500 in Victory bonds to soil conservation district and state winners. Supplemental prizes subscribed by merchants, bankers, district supervisors, county farm bureaus, civic clubs, schools, and others totaled \$1,850.50. This money, plus most of the bonds provided by the newspapers and radio station, went to contest winners in 56 soil-conservation districts and in seven counties not in districts.

The 1945 contest attracted much more interest than did the first one held in 1944 under the same sponsorship. At least 300 stories about the event were published by Kentucky newspapers. In 1944, there were 1,714 contestants who divided \$1,500 in war bonds and \$681 in local awards.—EDITOR.

IT is no wonder that Boone was favorably impressed with Kentucky. The rolling lands, enriched by accumulation of organic and mineral materials for centuries, supported virgin hardwood forests and abounded with game. Beneath the trees was a cover of smaller plants and litter which held back the rainfall and fed it into the numerous streams throughout the year. The

streams bore clear water, best suited for fish and land animals and desired by man. They afforded good transportation. The soil stayed in place and lost little from leaching. Truly, nature was in balance.

Then came the settlers, who cleared land and built homes. In selecting land for cultivation they gave little heed to the lay of the land or its

nature. It was all new and would produce a few good crops. They cut and burned the trees without regard to replacement. There was no time for soil conservation. Thoughtless practices continued until "the balance of nature" was disturbed.

The picture now changes. Cut-over or second-growth forests dot the State. Eroded, worn-out hillsides and those in course of depletion are too frequent. Streams carry muddy water, silt, flood and change their courses erratically. In spite of improved tillage, seed, fertilizer and other production factors crop yields are often less.

Saddest were the economic and social changes wrought. Farms and communities which once supported prosperous families, good trade centers, schools, churches, and local government of a high order for the period had often markedly deteriorated in these respects. In some sections the



Judging the contest. Seated, left to right: Ralph Wood, Department of Vocational Agriculture; Mrs. J. Kidwell Grannis, Kentucky Council of Conservation; A Threlkeld, president, Kentucky Association of Soil Conservation District Supervisors. Standing, left to right: H. A. Browning, commissioner of conservation, State soil conservation committee; J. E. Stanford, executive secretary, Kentucky Farm Bureau; H. K. Gayle, state conservationist, Soil Conservation Service; E. J. Kinney, College of Agriculture, University of Kentucky. Judges not in picture: J. F. Williams, State superintendent of public instruction; Mrs. Barry Bingham, representing the *Courier-Journal*, the *Louisville Times* and Radio Station WHAS.

assessment value of property for taxes had fallen to the point where roads, schools, and government could only be provided at the expense of more prosperous areas. With a lower standard of living often came lawlessness and less interest in education and social improvement.

These physical changes in the quality and substances of the soil were not without their effects upon the human body. Malnutrition of the inhabitants of certain soil-depleted areas has been observed for years but the medical records of se-



Barry Bingham, president of sponsoring newspapers and radio station, presents Victory bonds to winners: First James Stewart, Gracey, Ky.; second, Ruth Boyles, Tompkinsville, Ky.; third, Avalon Skaggs, Hodgenville, Ky.

lectees examined for military service in World War II definitely show several times the rate of rejection for areas of leached and eroded land as compared with areas of more fertile, better-cared-for soil. The quality of the food nutrients in plants grown on poor soils is not equal to that of crops produced on fertile soils well supplied with plant food elements.

From the foregoing discussion it is evident that the maintenance of fertile, productive soils, protected from erosion and leaching, is essential to the health, economic well-being and social progress of Kentucky's people. Our land does not provide the good homes, high standard of living and opportunity for relaxation and self-improvement of which it is capable. Our State experiment station and Soil Conservation Service have demonstrated, beyond any doubt, certain practicable measures which can be employed by most any land owner to increase or maintain the fertility of his soil and to preserve it from most losses. The costs of these practices are in keeping with the immediate benefits or increases in yields.

The first problem of the farmer in setting up a sound soil-conservation program for his farm is to determine in what use to put each area of land. Soils are derived from different materials and vary in many characteristics which affect their productiveness and suitability for different crops. The slope of the land and the erosion it has undergone also help determine its capacity for different uses or crops. The farmer often knows the capabilities of his land from experience and observation but unless he has made a special study of soil science, agronomy, and conservation he is often in no better position to appraise and weigh all the factors determining land use than he is to diagnose and treat

a sick cow for which he would immediately call a veterinarian.

This is where the soil-conservation district comes in. It is an organization into which farmers enter voluntarily and which provides the services of trained technicians from the Soil Conservation Service, experienced in solving the soil-conservation problems with which the farmers are confronted. In fact the technician points out many of the problems as well as aiding in their solution. After the farm has been surveyed for its land capabilities and a suitable use decided on for each area, the problem arises of the selection of crops, the balancing of their acreage with the land's suitability, with the livestock to be kept and with the farmer's resources as to land, labor, and capital. Then, there is the matter of special conservation practices needed for each area. In addition to liming, fertilizing, and drainage it is often necessary to employ terraces, strip-cropping, contour tillage, special seeding of grass and legume mixtures, and sodding for rotation cropland, meadows and pastures. These problems require the best thinking of farmer and technician.

Also, the district may provide special equip-

ment, such as machinery for the construction of terraces, outlets and ponds, at nominal cost. Lime, fertilizer, seed, trees, or other plants and conservation materials may be purchased cooperatively by farmers of a district. It is a means of enabling farmers to unite in solving drainage, erosion, or other soil problems affecting more than one farm. It provides for mass education and direction of farmers in soil conservation and has technicians of many kinds at hand to help the farmer with his problems at any time.

Upon the soil depends our strength as a commonwealth and our contribution to the Nation's strength and progress. Upon it rests the responsibility of bringing forth perpetually new generations of Kentuckians who can carry on the fine traditions of leadership, achievement in science and arts, and of gallant character which have been handed down to us. With the united efforts of our farmers and other citizens directed in a systematic approach to the problems of conserving Kentucky's soil, under the guidance of democratic organizations such as the soil-conservation district, I feel confident that we can achieve these goals.



Leaders on the Land

By A. E. McClymonds

IN 3 States, five farmers receive Skelly awards in 6 months. In every one of these awards, conservation farming takes the lead.

This system of recognizing farmers for superior agricultural achievement was created in January 1943 by W. G. Skelly, president of a large oil company. Congressional recognition of his efforts to establish national honors for outstanding farmers was made before Congress by Congressman Ross Rizley, of Oklahoma.

Each Saturday morning as Lloyd Burlingham, outstanding agricultural authority and chairman of the committee of awards, announces over the NBC network the weekly winner, farmers and

ranchers hear the part soil conservation has played in better and stabilized production.

One of the September awards was received by Joe J. Calder of Nuckolls County, Nebr. After pointing out that the Cornhusker State has 58 soil-conservation districts (as of November 1, there were 61 districts), the committee of farm leaders in charge of the awards reported that Calder is an outstanding leader "among the State's 97,900 farmers. He and his family own and operate a 600-acre farm and have worked out a complete system of conserving its fertility."

The farm is near Hardy and just a few miles north of the Kansas-Nebraska border. Calder, a cooperator with the Nuckolls County Soil Conservation District, started soil-conserving practices 10 years ago. As a result, 130 acres are terraced. In the last two years 46 acres have been leveled and seeded to grama and buffalo grass, and 30 acres have been seeded to brome grass.

"Having gotten the soil under control against serious erosion, a good rotation is carefully followed," the committee reported. "Both sweet clover and brome grass are valued in holding soil, and both are plowed under for humus."

NOTE.—The author is regional conservator, Soil Conservation Service, Lincoln, Nebr.

Calder keeps a milking herd of 14 cows, and a laying flock of 400 chickens. From 40 to 50 steers are fed out, and about 250 hogs are fattened to around 270 pounds each year. He is also active in community life, being a member of the Hardy Community Club, a director of the Hardy State Bank, secretary of the Farmers Union Elevator Co., president of the Union Church board, and secretary of the church's Sunday School.

Calder received the award, consisting of a \$100 war bond, scroll, pennant, and gold lapel button at a breakfast given in his honor.

Another Nebraska winner was A. H. Sibbernson, Washington County farmer, who won recognition for an amazing food production record of 300 tons of meat from a once run-down farm. Sibbernson, a cooperater with the Papio Soil Conservation District who operates 800 acres, was featured in the September 1945 issue of this magazine. Grain produced on his farm was used to produce 300,000 pounds of beef, 220,000 pounds of lamb, 96,000 pounds of pork, and 12,000 pounds of milk last year. All 800 acres are operated under a soil conservation plan that includes terracing, grassed waterways, contouring, retirement of the steeper slopes to grass and legumes, a balanced soil-building crop rotation and stubble mulch farming.

When told that his award included a \$100 war bond, Sibbernson asked that four \$25 bonds be issued instead to four hired men. These men, Sibbernson said, deserve credit for the farm's success.

Claude C. Cunningham, Eldorado, Kans., was another recipient of the Skelly award. A member of the State board of agriculture, a former legislator, president of the Kansas State Crop Improvement Association, expert grain judge and chairman of the board of supervisors of the Butler County Soil Conservation District, Cunningham operates a 128-acre farm near Eldorado.

Earlier this year, he said that he expected to harvest 800 bushels of hybrid seed corn, 450 of Atlas sorgo seed, 1,500 of blackhull kafir, 3,000 of brome grass, and 6,000 of popcorn. Additional expected production included 36,000 pounds of milk, 4,000 of spring lambs, 1,250 of veal, and 75 purebred hogs.

Louis and Oliver Aaen of Yankton County, S. D., who also received the award, operate 560 acres of land 5 miles northwest of Volin.

This year, the Aaen brothers, cooperators with the Yankton County Soil Conservation District,

grew 160 acres of oats which averaged between 45 to 50 bushels per acre, and had 240 acres in hybrid corn, 100 of which were terraced against moisture loss and soil erosion. Last year they produced 10,000 bushels of corn, 150,000 pounds of beef, 900 pounds of butterfat, and 1,000 dozen eggs.

They are believers in modern weed control practices. In cooperation with the soil-conservation program they have 10 acres planted in a Ree grass (intermediate wheatgrass) seed plot which is producing a heavy stand of drouth-resistant grass this year. Also leaders in livestock feeding, the brothers annually feed about 150 head of white faced Hereford cattle. Both brothers are members of the Volin Community Club of which Louis is treasurer.

In the months of April through September, there have been 26 Skelly awards presented. The awards have been mostly in the Mid-West, covering a 24-State area. Average State participation would be about one award a year, yet Nebraska, Kansas, and South Dakota have rung for five of them in 6 months. It speaks well for the conservation job being done by cooperators in those States.

GRAND CHAMPION

The grand champion steer at the Chicago International Livestock show last fall was fed on a farm in Wright County, Iowa, owned by Stanton Christie, Soil Conservation Service work unit conservationist at Mount Pleasant, Iowa. The farm is operated by Joe Duea who has a stock-share lease with Mr. Christie.

The prize steer, a purebred Shorthorn, weighed 1,110 pounds and was sold for \$10 a pound to a Chicago restaurant. The sale and prizes brought a total of \$12,375.

Carl A. Herkel, of Mason City, owner of the steer, contracted with Duea and Christie to do the feeding. The ration included brome alfalfa hay, beet pulp, and the usual grain and concentrates. The Christie place is farmed the conservation way.

WHEN IN NEED OF IDEAS

Essay contestants and others find useful materials in this magazine. *Soil Conservation* subscriptions may be obtained at \$1 per year from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



Balanced Ranching in Big Valley

By Irving Grover

Moving cattle from one field to another is part of a systematic plan for rotating grazing use. Ed Albaugh says that this, together with moderate grazing, is the key to maintaining his meadow and range in good condition and full production.

"Will some of that sweetclover seed be for sale, Ed?" asked one of J. E. Albaugh's neighbors just before driving off with a bunch of steers he had weighed on Albaugh's stock scales. Albaugh was in the process of harvesting the sweetclover seed that bright morning in September 1945 when his friend drove the cattle in for weighing.

SCALES and sweetclover symbolize Albaugh's position as a progressive and successful rancher in Big Valley. The scales eliminate guesswork as to whether his cattle or sheep are gaining weight as they should. The scales tell him when adjustments are needed in the grazing and feeding program. The sweetclover provides grazing to supplement range and pastures, and makes some of these adjustments possible. The result is that animals go to market in top condition, and that breeding stock is always thrifty. His breeding herds consistently produce 90-percent calf crops and excellent lamb crops.

Albaugh knows that what counts isn't the number of cows and sheep on the place; it's the pounds

of quality lamb and beef he sells every year. This means that livestock numbers have to be kept in balance with feed supplies. With that in mind he has reduced his original breeding herd from about 300 cattle to 200, including replacement heifers. When Albaugh kept 300 cattle he was selling yearling steers. Now he still further reduces the strain on the ranch-grown feed supply by selling calves in the fall so that he doesn't have to carry them through the winter.

Albaugh is adopting conservation measures all over his ranch to increase feed supplies. When the full effect of these improvements is realized readjustments will be made, but always so that there will be a balance between feed supplies and feed requirements.

The Albaughs bought their ranch in the spring of 1937. The ranch is near the town of Adin in what is known as Big Valley, in northwestern Lassen County, Calif. Somewhat isolated, Big Valley lies at an elevation of about 4,200 feet in the southern end of the Cascade Range. Rainfall averages 16 inches. Creeks which drain the valley flow into Pit River, a major source of the water in the Shasta Dam reservoir.

NOTE.—The author is work unit leader, Soil Conservation Service, Corning, Calif.



Farmstead behind, sheep in front. Rotation grazing helps meadow produce high quality forage.



Grazing management brings marked recovery of bitterbrush in one of Albaugh's fields (right of fence).



Albaugh sowed wheat in 12-inch drill rows with sweetclover in between.



Now healing is this gully which was eating into Albaugh's meadow eight years ago.



Three good reasons to conserve soil: Albaugh's children—Dale, Jean, and Ronnie.



Albaugh carries shovel to adjust flow of water when shifting cattle between fields.

The shape his ranch was in when Albaugh took over was typical of many other ranches in Big Valley, and of numerous similar areas in northern California.

In pioneer days about half the land that is now Albaugh's ranch was headquarters for an outfit reported to have run about 600 head of cattle and about a hundred head of horses. The other half was devoted to grain farming, the original owners reportedly having been the first to bring the modern combine to Big Valley early in the 1900's. Operators ran their herds on public lands and used the home ranch for wintering, calving and marketing. Under their system of stocking, the range adjacent to headquarters became less and less productive. With the life of the soil being sapped steadily, erosion began to get in its licks. Topsoil washed away in the winter and blew away in the summer. What had been range that produced several months of good grazing from perennial plants either had been plowed up or had become sagebrush and annuals, furnishing mediocre grazing for only 2 or 3 months.

The part of the meadow which had been used for grazing was also on the skids. Overuse had knocked out the good forage and the soil-binding types of plant growth. This allowed gullying to start in the lower end of the meadow. As a result, the water table was lowered, decreasing the amount and quality of feed produced.

Willow Creek, a mountain stream, cuts through the Albaugh ranch. It provides irrigation water for the 250-acre mountain meadow, the backbone of the ranch's supplemental feed program. It was concerning the improvement of this meadow that Albaugh, in 1942, went to T. S. Brown, Lassen County farm advisor, and asked for a cooperative demonstration plan for soil conservation. The soils on the ranch were mapped and a conservation plan was drawn up for the entire ranch in the summer of that year through the combined efforts of Albaugh, Brown, and Soil Conservation Service technicians.

The plans include leveling and reseeding the meadow when earth-moving equipment becomes available and finances permit. Previous to the drawing up of the plan Albaugh had made big strides toward improving the meadow land. First he stopped the headward cutting of a large gully. About 100 acres of the meadow had little clover growing in it. This area he reseeded to alsike clover, broadcasting the seed on the land in the

early fall. The result has been to improve the yield and quality of forage.

Along with this successful attempt to improve the quality of the hay and pasture produced on the meadow went several other good practices. These included constant vigilance and care in irrigation, changing the water frequently to conserve and make the most of a limited supply, and providing drainage of wet areas so that the desirable meadow grasses, such as meadow fescue, smooth brome, bluegrass, timothy, red and alsike clovers, could grow instead of sedges. Still greater production will be realized when the meadow is leveled and reseeded. The 130 acres of meadow used for hay production produces about 200 tons of high-quality meadow hay which keeps the herd of 200 Hereford cows and replacement heifers and about 60 ewes in good condition through the zero weather of winter.

Albaugh has also been trying various ways to improve his range, of which he has some 1,800 acres. Of prime importance was the fencing program undertaken shortly after the ranch was purchased. At that time, the ranch consisted of three large units which were difficult to graze properly. To remedy this situation several miles of cross-fences were built to make rotation grazing possible. Rotation, Albaugh says, forces the livestock to graze in such a way that desirable grasses are maintained vigorous and productive, and undesirable plants are held in check.

The soil on part of this range is a gravelly loam which has a hardpan within 8 to 10 inches of the surface. Reseeding on this soil is virtually impossible. Albaugh believes that good grazing management of the native forage plants is the only way to bring about improvement. To this end deferred grazing also has been practiced. The range was so badly run down, however, that progress is painfully slow. Albaugh isn't sure that the deferred grazing is a paying proposition, although in one field which has been deferred more than any other marked signs of increase in native perennial grasses such as smooth wild-rye and Sandberg blue grass can be noted among the sagebrush, and a protective litter of old grass is beginning to accumulate.

The soil of another part of the range is sandy loam. This soil is deeper and supports a vegetation of mixed bitterbrush and sagebrush. Bitterbrush is the choice browse plant on the semi-arid ranges of Lassen County but is easily killed or

stunted by improper browsing. Here the results of good management practices are most apparent. Young bitterbrush plants are everywhere to be seen, and the older plants are tall and thrifty. Proof that this condition is the result of good management is brought out by a comparison with other bitterbrush ranges in the valley. Where grazed improperly, bitterbrush is stunted and dying, no young plants can be found, and sagebrush and cheatgrass are taking over.

Water development has played an important part in the range improvement program by providing uniform grazing. When Albaugh first took over the ranch he put down a well, erected a windmill and built a concrete watering trough 8 feet wide, 2 feet deep, and 32 feet long. Last year he constructed an earth-fill dam which Soil Conservation Service workers surveyed and staked for him. This dam backed up 40 acre-feet of water when the reservoir filled last winter.

He also built a smaller dam in one of his smaller grazing units which had been without stock water except during the early spring, when because of soft ground and new growth, livestock would damage the forage plants by trampling and too early use. Another apparent benefit of these dams is the increased growth of desirable range grasses resulting from subirrigation of the stored water. The willows and other aquatic plant life which are starting to grow around the edges of these reservoirs will afford cover for wildlife.

Nearly half of the range has a deep, well-drained sandy soil. The former owners grew grain on this land and Albaugh, when he took over the ranch, continued to cultivate it, growing rye for the pasturage it afforded. He soon found that this did not pay, and, too, he was losing topsoil every year through wind and water erosion. Five years ago he started tentatively the seeding of alfalfa, sweetclover, crested wheatgrass, and Michels grass on about 50 acres. Now it is said that his 5-year-old stand of crested wheatgrass is as good as any in the West.

Last spring Albaugh bought enough seed of Ladak alfalfa, sweetclover, and crested wheatgrass to sow 100 acres. Careful seedbed preparation and drill seeding resulted in a good stand in spite of adverse weather. He is sold on the value of good seedbed preparation. He has tried both broadcasting and drilling on dry land without seedbed preparation and has found that it

doesn't work. This contrasts with his experience of seeding on meadows where no seedbed preparation was found necessary if the seeded area is properly irrigated and drained while the seedlings are getting started.

This fall enough Ladak alfalfa, sweetclover, and crested wheatgrass seed were harvested on the original trial areas to furnish seed for re-seeding another large acreage next year.

In addition to providing feed for livestock the sweetclover is a soil builder for the grain land. The extent to which growing of sweetclover will increase grain yields has not yet been fully determined. Two years ago Albaugh sowed sweetclover with wheat in 6-inch drill rows. The wheat harvested last year paid all expenses of establishment so that the income realized from the sweetclover seed this year is all profit. Last spring on another area, he tried sowing wheat in 12-inch drill rows with sweetclover between. This, he believes, is a much better system. In spite of the wider spacing of the wheat, the total yield per acre was very little less than usual because the heads were longer and better filled out. Albaugh feels that the value of grazing he obtained from the sweetclover after the wheat was harvested will more than offset the slight decrease in yield that was experienced this year. There is a distinct possibility that the yield of the next crop of wheat will be increased because of the nitrogen put in the soil by the sweetclover.

When asked why he had adopted so many soil-conserving practices on his ranch, Albaugh's answer was typical of most conservation-minded farmers and ranchers, namely, that soil conservation pays. It pays not only for its own cost, but it increases net income above that which can be realized when the needs of the soil are overlooked.

Albaugh, however, has still another reason for his soil conservation program. He has three fine children, two boys and a girl. He wants the ranch to be more productive when he hands it over to them than it was when he bought it. All three, young as they are, take an active part in some phase of the ranch work and they like it. Dale, the oldest, though only 10, drives the tractor pulling the combine or other equipment and handles cattle like an old hand. The others help with chores such as milking and feeding the chickens and pigs. He has good reason to keep the ranch productive so that at least one of his

children will want to take over when he retires from active ranch life.

As important as anything else to the success of the ranch is the good home management, supervised by Mrs. Albaugh and ably assisted by her mother. The two of them put out excellent meals for their family and for such hired men and visitors as may be on the ranch at different times of the year. These meals owe a lot of their success to the fresh vegetables the women folk grow in the garden back of the house.

In the 8 years on his Big Valley ranch Albaugh has done other things besides those listed here—things which make possible a general soil-conservation program on his ranch. Diversification is one of the most important. Although cattle are the principal source of ranch income, there are also sheep, chickens, hogs and milk cows. Except for protein concentrates which he buys and mixes on the ranch with his home-grown ground grain, he buys no supplemental feed.

Neighboring ranchers are much interested in Albaugh's sweetclover and range reseeding program. The value of the conservation practices and the wisdom of his idea of carefully balancing the number of livestock with the amount of feed that a rancher can produce or afford to buy becomes more apparent each succeeding year.

POTATOES

move into the Escalante Desert

(Continued from page 196)

At each well location overnight storage ponds have been built to store approximately 5 acre-feet of water. Such a system provides for the efficient use of irrigation water by making available a variable head of water to meet conditions of the soil and different water requirements of the various crops. It also reduces wasteful night irrigation by allowing the water to be applied during the daylight hours. Soil tests at the overnight storage sites indicated that considerable seepage would occur unless the ponds were treated with a sealing material. Technicians advised covering the bottom of the pond with a clay blanket 1 to 3 inches thick, together with an application of 5 pounds of salt for every 10 square feet. An excellent seal was obtained by spreading the clay and salt over the area, discing it into the top 6 inches

and compacting it with a sheep's foot roller.

Heavy seasonal winds cause considerable erosion during the greater part of the year. Last spring four and a half miles of 4-row protective windbreaks—squawberry, Russian olive, green ash and conifer—were planted on the south and west sides of the farm. The rows were spaced 6 feet between the squawberry and the Russian olive, 8 feet between the Russian olive and green ash, and 10 feet between the green ash and conifer. The windbreak will be extended each year until the entire farm is protected.

Crops will be rotated thus: potatoes 1 year (first crop on the newly cleared land), small grains 1 year (nurse crop for alfalfa), alfalfa 3 years. Beginning the sixth year this rotation will repeat, starting with potatoes. When the entire farm is under cultivation, there will be approximately 800 acres of potatoes, 800 acres of small grains, and 2,400 acres of alfalfa each year. It is estimated that the yields will amount to approximately 350,000 bushels of potatoes, 70,000 bushels of small grains, and 10,000 tons of alfalfa. The well-rounded farm plan contemplates that the grain and alfalfa will be fed to livestock. Corrals, feeding troughs, and other improvements are to be built as quickly as possible. Chemical analysis of the soil shows an ample supply of phosphate and potash but a deficiency of nitrogen. This deficiency will be corrected by adding 500 pounds per acre of commercial nitrogen with each planting of potatoes. Barnyard manure will be added to the alfalfa in the third year, and the last cutting of alfalfa will be plowed under as a green manure crop.

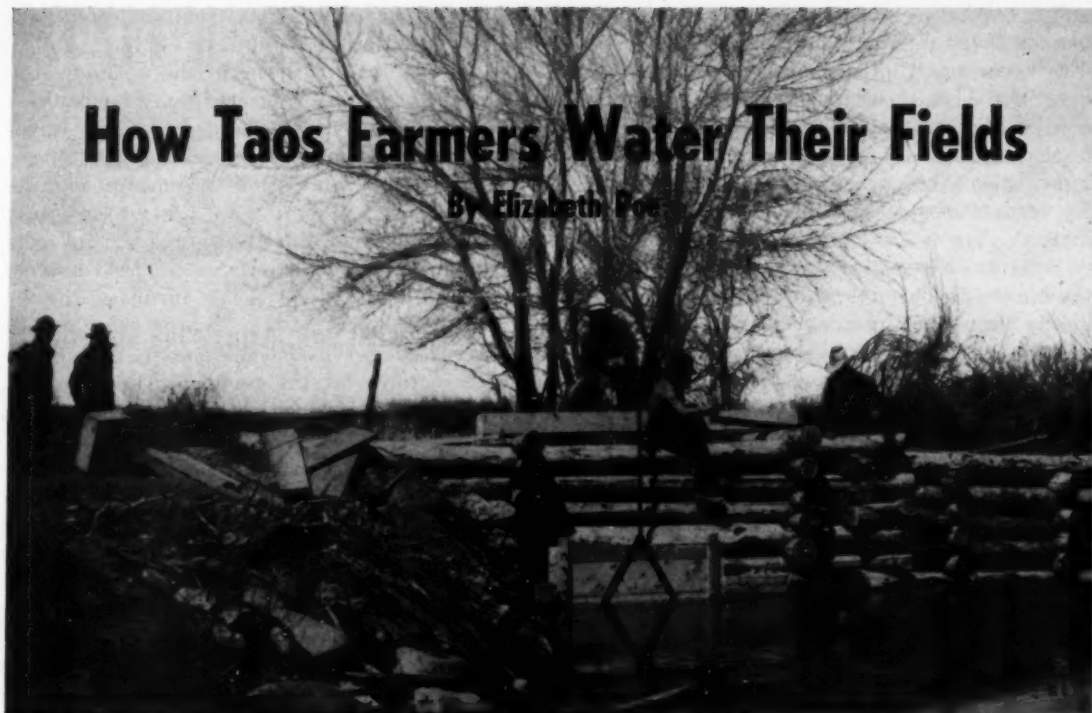
Eight hundred acres of land were leveled and placed under cultivation in 1945. Eight hundred additional acres will be leveled each year until the project is completed. Other plans include permanent concrete structures and gravel-surfaced roads.

Soil conservation practices thus are making a substantial contribution to the growing of superior certified seed potatoes on so-called desert land. It is likely that the Weyl-Zuckerman farm will serve as a model to all those who are interested in establishing themselves in this area.

The managed hedge has not only a land-use value but also an important influence on wildlife. It makes a good home for birds and small game.

How Taos Farmers Water Their Fields

By Elizabeth Poe



This heading on the "Acequia Madre de los Cordovas," 15 miles from Taos, N. M., required 400 man-days to construct. But it ended flooding on the ditch and now gives farmers two crops of alfalfa instead of one.

IN the Penasco Valley, 25 miles south of the village of Taos, N. Mex., there is less than one acre of irrigated land per person. The average total cash income per family is less than \$600 a year. Part of the land has been in cultivation since ancestors of the present inhabitants first broke the soil late in the sixteenth century. What these people have done to keep the land in cultivation since then makes them figure in the history of the oldest cooperatives in the United States.

The Taos Indian pueblo was discovered in 1540 by Hernando De Alvarado, who came into New Mexico with Coronado. Alvarado's followers were so attracted by the valley of Taos that some of them returned within a few years and settled in the mountain valleys and mesas. Today their descendants, who live in the same mountain villages in central and northern New Mexico, are raising what they need to maintain an existence. They use both obsolete and modern farming



Forty-nine landowners benefit from this new metal flume on the "Acequia de Peñasco." The log flume at upper left leaked water at both ends. Like 14 other irrigation structures built in this area since 1943, it was designed by Soil Conservation Service technicians and built by Spanish-American farmers.

methods, both modern and primitive irrigation structures. They employ community effort to maintain the supply of water that comes to their fields from the many streams of the valleys through *acequias*, or ditches.

The Spanish explorers who came to New Mexico 400 years ago brought with them a knowledge of irrigation acquired from the Moors. They combined this knowledge with the practices al-

NOTE.—The author is head of the current information section, Soil Conservation Service, Albuquerque, N. Mex.

ready in existence among Indian tribes, and the result was the community *acequias*—oldest cooperatives in the United States. These *acequias* were for the benefit of all townspeople—each man contributing to the upkeep of the ditch according to the amount of land he had to be irrigated. This system exists largely unchanged today, since the custom became New Mexico territorial law in 1880. The law provided for the use of water and the contribution of labor, to be directed by three commissioners elected by water users, and to be administered by a *mayordomo de la acequia*.

Lacking surveying equipment, the farmers laid out their ditches by allowing the water to trickle ahead of them, finding the flattest grade. The ditches had to be carried across *arroyos* (intermittent streams) and washed out gullies, and this method was also simple. The Taos farmers cut the tallest trees from their forests, hollowed them out by hand, and placed them across the *arroyos* to serve as flumes. Today these flumes, called *canoas*, or sometimes *canogas*, are used all over the forested areas of New Mexico, though in many cases water is lost from the ditch at both ends.

Today the tall trees are gone. As each *canoa* collapses, banks erode further and the problem of maintaining the water supply becomes urgent. Summer flash floods make the *acequias* more and more difficult to keep up every year, and mending the ditches after the floods requires days of hard labor.

One of these ditches is the 6-mile *Acequia Madre de Chamisal y Ojito*—"The mother ditch of the place where the sagebrush grows and the little spring." The *Acequia Madre* was built by hand 150 years ago by the members of 12 families who needed a better water supply for their fields. With constant care, this ditch today irrigates 1,000 acres and serves 120 families.

Manuel Rodriguez, *mayordomo* of a branch of this ditch, says the first line built from the *Acequia Madre* was constructed by an old lady who wanted to water her cows. This line, four miles long, now serves as the main ditch for the Ojito valley. It provides water for 30 families. Each farmer who takes water from this ditch spends 15 days a year working on it. He spends 13 days out of each year irrigating his farm. Don Rodriguez figures that about \$6,000 worth of labor is put on the Chamisal-Ojito ditch system every year to keep it functioning. Even then,

the 120 farmers who benefit from this ditch have no water during the winter.

To solve the problems of the *acequias*—the collapsing *canoas*, and the eroding streambanks—the men of the villages decided to make agreements with Federal and local agencies in a position to offer assistance. The agreements, with the Soil Conservation Service, the Extension Service, and other agencies usually required the villagers to provide labor and materials to improve a structure, while the Federal agents furnished the design and technical advice. Since 1943, the Soil Conservation Service has designed 15 new irrigation structures for the people of Taos County. Though the people contributed 1,200 man-days of labor and 117 team-days to build these structures, the control effected over the streams means fewer hours spent during freezing spring days in an attempt to repair flood damage.

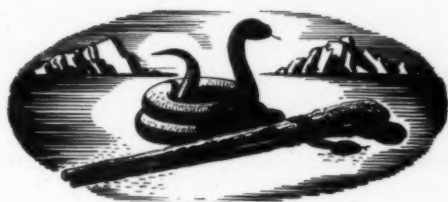
One of the new structures is on the *Acequia Madre de Chamisal y Ojito*, which once broke out annually and required 190 man-days of labor every spring for repair. A new log and rock heading on this ditch now controls the water that flows into it from the Rio Santa Barbara, and the danger of a washed out ditch is ended. Since most of the able-bodied young men had departed from Taos County for the war and defense work, old men and boys under age 18 did most of the work—much of it while standing in icy mountain water.

(Continued on page 213)



There's one irrigated acre per person here in the Pañasco Valley, 25 miles south of Taos. Average family income is \$600. Farmers use the valley for irrigated crops, graze their livestock on surrounding submarginal land.

STAFF or SERPENT?



By the Reverend Milton Heitzman

THE LORD had gotten Moses into a situation where he became cognizant of a need in his homeland and of a force that was greater than himself. Moses was told to go. "But suppose they will not believe me," answered Moses, "nor heed my plea, but say, 'The Lord did not appear to you?'"

The Lord said to him, "What have you in your hand?"

"A staff," he said.

"Throw it on the ground," said the Lord.

He threw it on the ground, and it became a snake.

Moses ran away from it, but the Lord said to him, "Stretch out your hand and lay hold of its tail." Stretching out his hand, Moses seized the snake, and it became a staff in his hand—"In order that they may be convinced that the Lord, the God of their fathers, did appear to you, the God of Abraham, Isaac, and Jacob."

God gave Moses that chance to go out and lead his people. But the interesting thing is the conversation.

All of us at some time or another have been given the challenge from our Creator, "What is in your hand?" And many of us have answered, "A staff." We have thought the land we hold in trust would always be near at hand, and the staffs, which we held in our hand would always be the same. But we have cast them on the ground and allowed them to writhe in uncontrollable, terror-raising coils from which we flee. The staffs which we once held have become serpents.

The three serpents of which I speak are The River, The Rail, and The Row.

Released from our grasp, the Mississippi River has become a tremendous, writhing serpent carry-

ing away homes, livestock, land, and loved ones—that river about which they say "it is too thick to drink and too thin to plow." It is too thick with the land that we once held in our hand. It is slimy with the rich silt of the Middle West. That which was once a staff, has been cast on the ground and has become a serpent and thousands of men, seeing it, turn and flee. But we must stop, grab it by the tail and cause it to become a staff again.

The second serpent I would like to mention is the steel rail. Its shiny, winding beauty is alluring to the greedy. It beckons him to ship off his corn and cattle—his good plant food. The serpent—the steel rail—carries the plant food to the city and dumps it uselessly and poisonously into the rivers to be carried to the sea. That serpent needs to be grabbed by the tail and made into a staff that will be useful.

Conservationists are really doing something about the third serpent—the straight row. They have grabbed him by the tail and have caused him to curl around the hills in graceful lines called contours. But as I drive through the country I see that there are many other of those serpents laid out in straight patterns to resemble staffs but in reality to be numbered among the most evil of serpents. God and Man say to all of us, "What have you in your hand?"

When we carelessly cast them aside, the staffs become serpents but when we properly use the Row, the Rail, and the River, they become staffs once more. It is not too late to grab the serpent.

Many of us are most interested in one phase of soil conservation. It is the reason I—a minister—feel I have a place as important in soil conservation as that of farmer, soil conservationist, or student. I am primarily concerned with *what soil conservation does for the people*. I believe soil conservation is the one thing that will give rural people the new heart they need for living in this troubled world. I believe Soil Conservation will give them what Edwin Markham has said we all need:

*Three things must man possess
If his soul would live and know life's perfect good—
Three things would the all-supplying
Father give—
Bread, Beauty, and Brotherhood.*

As I see it, three types or groups of people develop when they begin associating with that dy-

NOTE.—The author is a minister in Melvin, Ill.

namic which we so carelessly term "soil." These groups are known as the Pioneer, the Conqueror, and the Serf. They are not definite groups or even particular types that are set apart immediately upon their birth and destined to remain that way. Rather, they are persons who are marked not by birth or wealth but by *attitude*.

THE PIONEER: Here is the hardy one. The pioneer in Europe was the man who could follow the Roman and the barbarian and the Norman conquerors. He could go into all of the ruin and pillage, and with deft optimism, set things aright. He could start little villages and begin to farm the land, ever looking forward to a better day for his son or daughter. He was resigned only to the fact that the hardships of today would lead to the ease and rest of the morrow. Bread, beauty, and brotherhood were his.

God spoke to him and said, "What is in your hand?" The pioneer looked at his callouses, his makeshift implements, his tiny hut—all creations of his own. He looked at his neighbor, and with a glow in his eyes, he replied: "A staff. I will not cast it on the ground—I will hold it for the future."

The pioneer in the United States and in the earlier colonial days has been the same rugged individual. He has worked, and planned optimistically, holding thanksgiving services for the little that he had and taking the hardships as they came. The pioneer who has gone before us has always been the one to look far into the future, to plan for it, and to work for it. He is the foundation of this, our country.

THE CONQUEROR: The second type is the conqueror. He, too, has come into all the lands of the world and has ridden swiftly across them. He is the barbarian, the Roman, the Genghis Khan, the Cortez, and the Custer. He is the one who, with selfish arrogance, has ridden in with the battle cry and the war-making instruments. He has ridden in, and behind him has lain a torn and bleeding earth. Behind him has been devastation, sickness, heartbreak. The warrior of the bloody battle is not the only conqueror. Read the book, *Robber Barons*; read the stories of the so-called "conquering" of the great Northwest; read of the "conquering" of the Great Plains by tractors and big-time farmers. Read the story that is now being written wherever men think only of their fields as great places of production and not as places to bring bread, beauty,

and brotherhood to all the world. The conqueror is still riding, still destroying. The future of our day depends upon it, we say, but that raises the question: "What have we in our hand?"

THE SERF: The third type is the serf. This is a term that is coming back into use since Hayek's book, *The Road to Serfdom* hit the bookseller's table. My own characterization of the serf is this: He is, in his own mind, the last of all men. His task is to live from day to day and perhaps to the end of the week. Although he may be young in years, he is old in mind and thought. There is little refreshing about him. His is the air of a pessimist. Nothing good can come, so let come what will. The serf we have with us. When asked: "What have you in your hand" he turns, looks, and says, "A serpent" and casts it on the ground where it soon devours him and his people.

To illustrate these three master types let us take one farm. It is a farm that is owned by the same family that owned it when the grandfather, a true pioneer, came upon the land and settled it, paying \$5 an acre.

For many years he worked the land, raising his own horses and raising his own flour. For many years he and his wife lived there happily and raised their family in true pioneer fashion. But gradually they became rich and as wealth was added to their possessions they began to exploit the land. Hordes of hired men came. They drove teams of mules with gangplows and plowed everything in sight. They raised wheat and corn, and the old pioneer died.

Then came his son. His was the attitude of the true conqueror. He could see before him only the acquisition of more land and more wealth. He saw that in his hand was a conqueror's staff. He used it to buy more acres, to farm more land, to hire more men and to run more plows.

He died. His son was caught, as they say, on the downgrade. Things went from bad to worse. He had in his hand the staff of the serf, but he did not know it. He believed that it was his job to hold that which he had, and this he tried unsuccessfully to do. No longer could the land produce crop after crop of corn and wheat. No longer could he raise the cattle that he did because men would not work for him at puny wages. The third generation had cast down his staff, and the serpent was beginning to devour.

Then, I noticed the land. For one mile there was little but swamp and gullies. The huge, picturesque hill was no longer a place of beauty but lay groggy with age and mistreatment, exposing its sore, cut sides to wind and water.

I walked to school with the son of the great-grandfather and we played cops and robber and cowboy and Indian in the huge gullies.

I walked to school with the son of a serf who was brought up in pessimism and lack of hope for the future. That boy did not become a farmer like his father and grandfather and great-grandfather. Today he is a clerk in the office of a county treasurer.

But in all this dark picture from hardy pioneer to conqueror and back to the role of serf, there is a ray of hope for the man who sees farming as a way of life.

At Thanksgiving time I visited this farm again. There is a second son. When asked: "What have you in your hand?" he did not cast it down and flee from the serpent, but rather he answered: "A staff!" and began to do something about it. With the son at the time was a work unit conservationist of the Soil Conservation Service. He brought with him facts, figures, and suggestions—and the hill began to have a chance.

But I was not so much interested in the hill, the grass waterways, and the fine new dam that has been built there, as I was in the change that has come over the family. No longer would they be classed in the group which we call serfs. Now they rate as pioneers once more. The new spirit has enfolded them—the spirit of hope and confidence. The staff is once more in their hand. They have grabbed the serpent by the tail, and have changed it into a staff of helpfulness that leads them on into a future being built not selfishly for themselves but for their children's children.

Thus, we begin to get the whole picture. God is constantly challenging us to look, "What is that in your hand?" We answer always sometimes as the conqueror, saying, "All that is, I hold in my hand!" and we lay waste to the land and leave it only for the serf. Sometimes we answer as the serf and say: "Nothing. All that I see is a serpent which will devour me or my children."

Sometimes we may answer as the pioneer and say, "A staff." And with that answer goes all the hope of bread, beauty, and brotherhood.

"We All Must Work Together"



They raise cane, and in a few hours the scum must be dipped off the top of the syrup that's a-making. E. J. Schumacher and A. B. Patterson (right) trade their work and their conservation ideas.

By A. B. Patterson

E. J. SCHUMACHER used his tractor to plow out L. L. Andrews' Bermuda sod where it was too heavy for a team to pull easily. C. D. Crocker sent his son over to help Dr. J. E. Burney fertilize and seed white Dutch clover. Crocker assisted George Boswell in cutting wood for fuel. W. L. Andrews supplied barnyard manure and helped L. L. Andrews seed pasture grasses.

That sounds like community action of the pioneer sort, a kind reminiscent of neighborhood logrollings and husking bees. In spirit, that's exactly what is going on in a good many soil conservation districts.

Farmers are helping each other to conserve the soil resource and increase crop production. Soil conservation districts call it group action. Schumacher, Andrews and the others are representative of one conservation group, located in the Bédias

NOTE.—The author is work unit conservationist, Soil Conservation Service, Fort Worth, Tex.



This farmer, E. J. Schumacher, pools labor with his neighbors to get conservation measures on the land.

Creek Soil Conservation District, Madisonville, Tex.

Schumacher has been designated group leader by the district's supervisors. He was named in August 1945, when the community's conservation farmers organized as the Oak Grove Conservation Group.

It is part of Schumacher's job to get his group together occasionally to talk over ways to do better conservation work. Sometimes a district supervisor attends and helps in the discussion. At other times a Soil Conservation Service technician may be on hand with the latest ideas on conservation farming. Such meetings are held several times a year.

"I've found the men in this group so interested in doing the conservation work that I don't have to ask them to cooperate," says Schumacher. "They can see for themselves that there are a lot of jobs—sodding Bermuda grass, for example—that two men working together can save time on.

"We couldn't hire labor if we wished. There isn't any available. We have to work together. But we want to, anyway."

Schumacher himself is a main force in the success of the young Oak Grove Conservation Group. A resident of the community only two years, he already is accepted by the farmers of the area as an "old timer" because of his helpfulness.

In addition to plowing out sod in a cultivated field where L. L. Andrews' mules would have had

a tough pulling, last fall Schumacher helped both L. L. and W. L. Andrews spread 20 percent phosphate on their pastures and cultivated land preparatory to seeding white Dutch clover and hairy vetch. Schumacher used his tractor and fertilizer distributor in doing those jobs for the Andrews.

Schumacher has a power-saw attachment on his tractor which he uses to help his neighbors cut fuel wood. He is planning to buy a terracing machine to build terraces for himself and for other conservation farmers. Owner of a sizable barn, Schumacher made storage space available for L. L. Andrews and C. D. Crocker to store their phosphate in until they were ready to spread it.

But the assistance works two ways. Andrews brought his slip up and helped Schumacher with necessary terrace fills and other terrace maintenance.

There isn't any need to hunt for examples of group action in Oak Grove. They are numerous. George Boswell helped Crocker spread phosphate in preparation for seeding hairy vetch and white Dutch clover. Boswell brought his tractor along for the job. He pulled a fertilizer distributor owned by supervisors of the district.

Boswell has a syrup mill. He cooks while L. H. and W. L. Andrews and Schumacher clean the cane patches each owns. That's the way conservation group action works. The farmers all help each other.

Conservation work in the new group is just getting under way. Planting the winter cover crops, seeding the clover in pastures and meadows, building terraces and outlets, and mowing grasslands to control weed competition are some of the measures the district cooperators have instituted.

Schumacher's farm, as well as his work for the other group members, provides a good example to the community. He was following a number of conservation measures even before he became a cooperator of the district.

He's had good results from hairy vetch. One plot grew an excellent crop during the winter of 1944-45. "That was a piece of ground where a fellow who used to operate it said nothing but goat weed would grow. All it needed was a good

vetch crop followed by field peas to mellow up the soil. I grew the peas last summer. The field'll grow anything now," maintains Schumacher.

Schumacher cultivates some land, uses other acres for pasture and meadow, and has some woods as a source of fuel. He grows considerable feed for his 48 head of cattle, 7 horses, and 2 mules. Corn and alfalfa are the principal feed crops, with sorghum helping out. The hairy vetch provides a certain amount of forage in winter, but Schumacher likes to get all the growth possible on his vetch so he can turn it under as green manure.

An area of new ground which Schumacher broke out in 1945 made him 61 bushels of hybrid corn per acre. He fertilized the field. Yellow dent fertilized the same way on an old field made 38 bushels. The local average is around 12 bushels. Schumacher's yellow dent had the benefit of a soil-building legume.

This year Schumacher is trying an experiment his neighbors are watching closely. He has planted alfalfa on upland. The group leader spread a ton of lime to the acre under the alfalfa. He

then applied 200 pounds of phosphate to the acre. After he gets a first cutting off the alfalfa Schumacher will top dress with nitrate of soda. If it works out satisfactorily, several of the men in the community plan to try some alfalfa next year.

There are 1,863 acres in farms in the Oak Grove Conservation Group. Schumacher owned 475 of those acres. "All of us see that we have to do conservation work to hold our land," he says. "We've got to build up our fertility and productivity. The conservation measures designed for my farm are helping my place materially—look what the vetch is doing to that old goat weed field. It has put it in production. If my work helps any one else to have a better farm and a better living, I figure it's worth doing.

"Our farmers need to work together. Too much erosion on my neighbors' farms will eat back on my place in one way or another before long. If they don't make a pretty good living we can't support a good school or good church. This conservation group is merely using common sense. We all must work together."

(Continued from page 208)

Four communities have constructed metal flumes to replace the leaky *canoas*, and there are demands for still more of them. The flumes are on the *Acequia de Penasco in Rio Lucio*, on the *Acequia de la Otra Banda*—"the ditch on the other side" on the *Acequia Madre del Pueblo de Taos* and in *El Valle de San Miguel*. They benefit 365 families who once never knew from week to week whether there would be enough water.

One *Taoseño* who was the most reluctant to submit to outside help is Blas Chavez, of Los Cordovas. His family is a new one, according to Taos standards. His grandfather was its first member to farm in New Mexico. Today Chavez proudly discusses the improvements made on his farm.

"All I have to do when I want to irrigate now is send my kid to turn the wheel. Before, when we had the most water, we couldn't irrigate.

Blas Chavez gets irrigation water for his land from the *Acequia Madre de Los Cordovas*, which starts about three miles from his farm, where it is diverted from the *Rio Grande del Rancho*. Last spring he and his neighbors contributed 400 man-days of labor to build a heading for their ditch, thereby ending flooding, ditch labor and repair. The heading controls the amount of water that flows into the *acequia* from the *Rio Grande*

del Rancho, and when the Rio floods now, the farmers have only to close their heading to save their *acequia*. It also gives them two crops of alfalfa instead of one, because they get water earlier.

Blas Chavez was a member of the New Mexico State legislature in 1937, and it was during that session that the law legalizing the formation of soil conservation districts was passed. Blas voted against it, but he is now a supervisor of the Eastern Taos Soil Conservation District.

"The people had been forgotten too long. They were afraid of any legalities—afraid that they might be swindled out of what land they have left. But they have come to understand, little by little, and I think now that Taos County is the most blessed county in the State."

Because of their labors, 593 families who cultivate 5,000 acres of land in Taos County now know a more certain living. When other lands of the Southwest have changed hands a dozen times, and have been turned over to commercial enterprise, the subsistence farmers of Taos County will undoubtedly still be on their slopes, figuring new ways of keeping their livelihood intact, and new and more permanent methods of bringing water to their fields.

Joe Now "Lives at Home"

By Louis E. Reid, Jr.

CONSERVATION farming methods are helping Joe Anderson, negro cooperator with the Harrison County Soil Conservation District, who lives near Marshall, Tex., conduct a successful, profitable farming operation on 122 acres of land which only cost him \$11 an acre when he bought it in 1929.

Erosion control measures and diversification—getting away from having nothing but one crop of cotton after another—have been key points in Anderson's success on the 122 acres.

After he first bought his farm in 1929 Anderson got along all right for a few years, but he kept noticing that each heavy rain washed more topsoil from his fields down the creeks and into the river. Crop yields steadily diminished. In 1941 Anderson made only a bale and a half of cotton on 6 acres and the year was considered a pretty good one for growing cotton.

That was when Anderson went in to see his soil conservation district. With technicians of the Soil Conservation Service assigned to aid co-operators with the district, Anderson went over his entire farm, and together he and the technicians worked out a plan which would make the best possible use of every acre and every field on the place.

The results of Anderson's signing up with the district showed up at the end of the very first year. In 1942, 6 acres on his farm produced 3½ bales of cotton—more than twice as much as the good year of 1941 had produced on the same amount of land.

A crop rotation was partly responsible for the additional yield. Anderson had planted hairy vetch as a cover and soil improving crop. Vetch, a legume, had added needed elements to the soil and the increased cotton yield followed.

Anderson's rotation now consists of cotton and corn interplanted with cowpeas in combination with hairy vetch. He raises each year a few acres of cowpeas and peanuts for hay and an acre or two of cane, sorghum and potatoes.

NOTE.—The author is information specialist, Soil Conservation Service, Fort Worth, Tex.

As another phase of his conservation farming system, Anderson has built 3.8 miles of terraces on 56 cultivated acres, doing the work with a team and turning plow. His terraces all empty into well-sodded bermuda grass outlets established before starting the terraces.

Anderson is a great believer in bermuda. Noting a small wash at a point where a terrace emptied into an outlet channel, he immediately picked up his shovel and went to work. "I'll put some bermuda grass in here," he said. "Then it won't wash."

Anderson doesn't go along at all with farmers who don't want bermuda on their farms, "I've learned that fighting and cussing bermuda is like arguing with your wife," he says. "You can't win. The best way is to get along with it, learn to handle it, and then you can have it solving more problems than it ever created."

With a start of 9 head of cattle when he signed his agreement with the district in 1941, Anderson increased his herd until he now has 18. He believes that by clearing sprouts from his 49 acres of pasture, buying a mowing machine and using it regularly he can build up his herd to 36 cows. This, and the establishment of a good Kobe lespedeza meadow, are among his immediate plans for the future. He will be financially able to carry them on, since he has been putting money away regularly in the form of war bonds.

He has a source of immediate cash, if he cares to sell, in a 28-acre woodland, but at the advice of Soil Conservation Service technicians he has decided to let his 8- and 10-inch trees stand several more years before harvesting them under selective cutting methods. It will mean more money in the long run.

Anderson has two boys in service, one in the Navy, the other in the Army. He says that terracing, contour cultivation, crop rotation, and use of soil improving crops have enabled him to grow more on fewer acres with less labor.

A small orchard, a good garden, plenty of chickens, eggs, milk, butter, and a year's supply of pork in his hog pasture and his sound conservation farming methods allow Anderson to "live at home."

Twenty million acres of American land are devoted to roads and highways. They constitute an opportunity for erosion control and for the encouragement of wildlife.

REVIEWS

TWO BILLION ACRE FARM, AN INFORMAL HISTORY OF AMERICAN AGRICULTURE. By Robert West Howard. 209 pages. Doubleday Doran & Co., Inc., Garden City, New York, 1945.

"This is the story," writes Mr. Howard, "of a 1,940,000,000-acre farm and of its cultivation between 25,000 B. C. and A. D. 1944." Most of the story is about agriculture and the many factors bearing on it in the United States from Colonial times to the present day. All of it is sketched in racy, robust writing, and most of it is very well done.

Here is the history of the cotton gin, of condensed milk and tin cans, of barbed wire, fertilizers, and frontier life, and of farm machinery, grasshopper plagues, California orange groves, and a wide variety of other things, all told with vividness and savor. But the author does more than this. In the last half dozen chapters he traces the trend of population and economic power from country to city, studying the relation thereto of the Grange movement, Farm Bureau, the United States Department of Agriculture, and the urban industrialist. He shows how "in the shadows and breathlessness of urbanism the family life and religious convictions were dying"—and how, in contrast, the landmen held "a sense of individualism * * * family pride and cooperation, * * * faith in a Creator and a Creator's things * * *."

There follows an analysis of agricultural control as practiced by the centralized powers of the Government and big industry, ending with the comment that we had arrived at a "regimented bedlam" at the beginning of the last war. "Meanwhile, out on the land itself * * * the individualists were building another road back to economic parity for agriculture"—by means of farmer cooperatives. "Through them * * * could return the economic equality, the classlessness, the strong family ties and individualism that Government had been trying to regain, through centralization, all along."

The strong farmer cooperative movement will influence the decentralization of Government and industrial power. "This will mean, inevitably, an end of the American city as we have known it for the past one hundred years, and a return to village or farm life for the bulk of the population." The original objective of the migration to North America, declares the author, "was *ownership of land and resultant family security*." The city has proved its inability to fulfill either of these human urges, and, with the "development of the automobile, the radio, the streamline train, the rural electrification projects, plus the potentials of World War II discoveries * * * has itself become economically passe."

"So the path of America's future leads back to the land * * *. It will be a return to the seasonal work program of the medieval manors, operated this time by freemen and simplified by machines: work on the land in summer months; work in factories or some other form

of craft or professional project in winter months * * *. The home * * * would again become the bulwark of American life. Human roots would sink deep and true into the good earth. The valued inches of topsoil—the one constant, seasonally recurring asset of the Nation—would become a common word instead of a mining property exploited by one-fourth of the population because of the cash economy of the three-fourths living in cities."

"Then, and then only, under the stars and in full realization of the directive forces beyond the ken of human knowledge, secure in land and family, America can set a true pattern for world peace and world security."

—William R. Van Dersal.

CHARTER FOR THE SOIL. By John Drummond. 219 pages, illustrated, bibliography. Faber & Faber, Ltd., London, 1944.

John Drummond has written a thought-provoking book on agriculture. You may not share his views but you will like John Drummond.

He introduces himself as a small Scottish laird, trained in the ways that have come down from father to son for the past 800 years. He tells us in his foreword, "In 1928, I came to the conclusion that the landlord-tenant combination was played out. I devised a new system to replace it; estimated my plan to take, with the cash available, twenty years to complete. At the moment I farm seven farms, and have the central organization in working order. During the last fifteen years I've thought a bit, and read a bit, even listened a bit—I believe my plan is applicable to the country as a whole. This book, then, is a plan for the future of British agriculture—a plan which is intended to place it on a footing comparable with that of other industries; to put it in such a position that it will pay its way without subsidies; to reorganize it so that it can provide fresher foods to the consumer; to plan it for freedom from slump and political whims. * * *. But this book is not a book of fashion; remember that, for I am going to take a running kick at a whole crowd of fashionable scientific theories."

"Charter for the Soil" does indeed find flaws in many accepted ideas of scientific agriculture. But John Drummond is no crank and his views are reasonable, stated without equivocation. Readers may sometimes become impatient with the way details are dovetailed into major discussions, but these seemingly minor points help to make clear what the author wants us to think about.

The author incorporates many ideas imported from the United States, but sometimes he is a bit vague on our geography, as when he places our "Dust Bowl" in "fertile cotton lands of the past." If John Drummond spent a year touring the United States, his plan would benefit from study of our local soil conservation district operations, our farm and fruit cooperatives, and our erosion-control practices. But, quoting John Drummond, any plan is made to be improved—life never stands still.

—S. B. Detweiler.

REFERENCE LIST



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